Astrophysics Research And Analysis

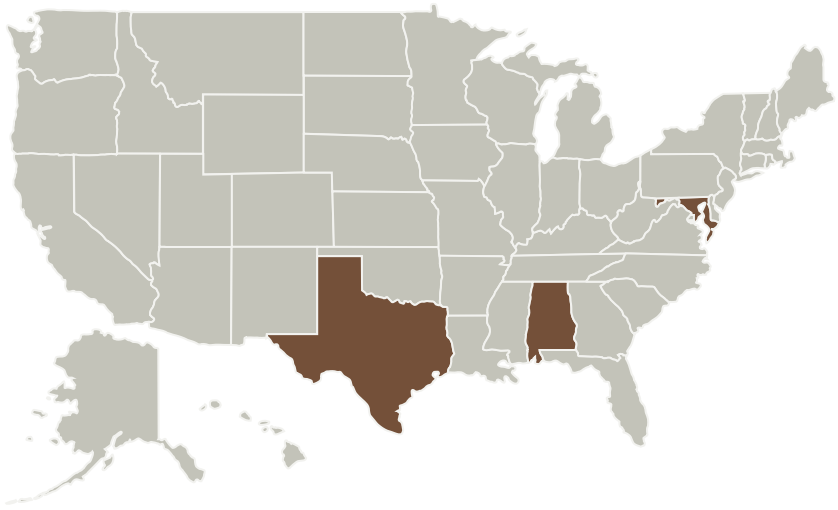
Data Analysis Technologies to Reduce Risk in Future Gravitational-Wave Missions

Completed Technology Project (2017 - 2020)

Project Introduction

The existence of gravitational waves has at last been confirmed by the LIGO/Virgo discovery of a binary black hole merger, heralding the beginning of a new fields of research in observational astronomy, astrophysics, and relativity research. the LISA Pathfinder mission has begun collecting science data, paving the way for space-based gravitational wave measurement. Gravitational wave science will reach its full potential with a space-based observatory able to access mHz frequencies. The proposed work will investigate how develop crucial data analysis infrastructure for a future space mission. The three key themes of the proposal are (i) to incorporate lessons learned from LISA Pathfinder into our understanding of a GW observatories performance, (ii) develop data analysis methods for inter-spacecraft ranging critical to achieving the measurement precision needed for GW detection, and (iii) explore how known sources in the mHz band can be used as calibration sources.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Universities Space Research Association(USRA)	Supporting Organization	R&D Center	Huntsville, Alabama

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Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Responsible Program:

Astrophysics Research and Analysis

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Primary U.S. Work Locations	
Alabama	Maryland
Texas	

Project Management

Program Director:

Michael A Garcia

Program Manager:

Dominic J Benford

Principal Investigator:

Tyson B Littenberg

Co-Investigators:

Melisa A Reyna
James I Thorpe

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.6 Ground Computing
    - TX11.6.7 High Performance Data Analytics Platform

Target Destination

Outside the Solar System